BON SUCRO
The global sugarcane platform

BONSUCRO GUIDANCE FOR EXPERTS

– EXPANSION OF CULTIVATION v2.0

1. BACKGROUND

This document is designed to help growers implement Bonsucro's requirements related to expansion of sugar cane cultivation, as set out in Indicator 1.2.2. It includes, as a core part, the "Bonsucro HCV Risk Assessment for expansion" procedures, structured in the form of a risk assessment questionnaire and associated risk mitigation procedures.

> 1.2.2 The operator conducts a risk assessment on compliance against the Bonsucro Production Standard.
> **Prior** to any greenfield expansion or new agricultural projects, the operators conducts the 'Bonsucro risk assessment for expansion and implements the risk assessment procedures

One of the intents of Indicator 1.2.2 is to avoid agricultural expansion into areas of natural ecosystems generally, and to avoid that expansion leads to loss or degradation of High Conservation Values.

Prior to preparing lands for expansion the operators complete the Bonsucro risk assessment for expansion and implement the risk mitigation procedures. The risk assessment referred to in the indicator distinguishes four different risk level outcomes, A to D, each linked to a procedure for risk mitigation commensurate with the level of risk (see Expansion Guidance for operators).

Two risk level outcomes require technical input from an independent expert prior to expansion proceeding to mitigate the potential risks. This document provides guidance for the expert on the expected outputs that will inform the expansion plan.

Risk level	Required output from expert	Relevant section of this guidance document
B	Document and characterise affected ecosystem(s) in the proposed expansion area as either natural or non-natural	Section 2
C	Document and characterise affected ecosystem(s) in the proposed expansion area as either natural or non-natural Assess risks to environmental HCVs and the extent to which these may be mitigated	Section 2 and Section 3

2. IDENTIFICATION OF NATURAL ECOSYSTEMS

2.1 SCOPE

Bonsucro certified operators have committed not to expand cultivation into natural ecosystems. In cases of small-scale expansion, the guidance includes three examples of vegetation/past land use that are not considered to be natural ecosystems[1], and that should be straightforward for growers to diagnose themselves, leading to risk procedure A. All other types of vegetation/land use contexts, as well as cases that operators find difficult to characterise, should be subjected to identification as natural or non-natural ecosystem by an expert, as outlined in **Mitigation Procedures B and C.** Potential sources of information include satellite imagery and materials and vegetation maps compiled by the mill operator for their unit of certification, combined with field observations and validation.

2.2 QUALIFICATIONS

Experts must have adequate theoretical and practical subject matter knowledge, normally an academic degree in botany, ecology or similar, basic remote sensing imagery interpretation skills, and regionally relevant field experience from vegetation mapping / analyses. Experts must also have personal integrity – whether an area is classified as natural ecosystem(s) or not may have significant financial implications for operators planning to expand their business, so there may be cases of direct or indirect pressure on experts to come to the 'right' conclusion.

2.3 TERMS AND TIMEFRAMES

Experts may be commissioned by grower operators themselves, or by the mill operator supporting their suppliers. Timeframes and fees are to be agreed by the parties. The time required will be highly scale and context dependent – from maybe half a day in the field in simple, small-scale situations, to a week or more of desktop interpretation of satellite imagery followed by multiple site field validation of vegetation in complex, large scale expansion scenarios.

2.4 NATURAL ECOSYSTEMS

The glossary to the Bonsucro standard defines a natural ecosystem as "an ecosystem that substantially resembles — in terms of species composition, structure, and ecological function — one that is or would be found in a given area in the absence of major human impacts. This includes human-managed ecosystems where much of the natural species composition, structure, and ecological function are present".

The core of this definition is that natural ecosystems look and function much - but not necessarily exactly – like they would if they were in their historic natural state. However, most, or indeed all, ecosystems have been subjected to some form of human use or alteration, with more severe degradation or conversion resulting from industrial-scale agriculture. In reality, there is a continuum from 'fully natural' to 'totally artificial' – the task of the expert is to conclude where a certain site is positioned along this gradient, and whether the conceptual threshold that separates natural from non-natural has been passed.

The Bonscuro standard aligns with the Accountability Framework initiative (AFi) definition of natural ecosystems and no-conversion of natural ecosystems. For guidance and practical examples on how to apply the AFi definitions related to deforestation and the conversion and protection of natural ecosystems see AFi's Operational Guidance.

[1] a) fields currently used to cultivate another crop; b) lands used for crop cultivation within the last five years (fallows, 'deserted fields'); c) pasture land, cleared from forest or woodland more than ten years ago, with no or almost no trees, and no or almost no regenerating seedlings or saplings.

2.5 FORESTS

The definition refers to natural species composition, structure, and ecological function as three key natural ecosystem characteristics. However, neither species' composition (other than trees in boreal and some temperate forests), nor ecological function lend themselves to rapid assessments (forests ecological functionality is a challenging topic also for well-resourced, large scale research programmes). Thus, in practise, these aspects are inferred from a combination of structural characteristics and indicators of past and present land use, assuming that ecosystems with few signs of major human impacts also retain much of their natural species composition and ecological function.

Fortunately, forest structure is more accessible, and presence of big trees, a variety of tree species, diameter spread, dead trees and coarse woody debris is often sufficient to distinguish natural forests (including managed 'semi' natural forests) from plantations (often consisting of even-aged, non-native, single tree species).
Less clearly addressed in the definition is how to classify human-managed forests where currently little remains of the natural structure. Examples include stand-level logging sites with some retention trees, where pre-logging structural complexity is expected to return over time as a result of natural processes and/ or management interventions. The Forest Stewardship Council (FSC) explicitly includes as natural also forests where "a combination of natural and artificial regeneration is used to regenerate forest of the same native species with most of the principal characteristics and key elements of native ecosystems of that site".

However, some forests are so severely degraded that they have lost the capacity to revert to their historic state. A key question to determine if this is the case – and consequently whether to now consider the site as a non-natural ecosystem – is to ask: is the site likely to revert back to a significantly more natural, complex and diverse ecosystem over time by itself, i.e. without human interventions other than eliminating, or greatly reducing, current degradation pressures? The answer depends on a number of contextual factors, including what caused the degradation in the first place and to what extent these factors still operate, the level of fragmentation and proximity to sources of seed dispersal, the extent to which the soil and the ground vegetation is conducive to seed germination, changes in local climate due to extensive nearby local deforestation etc. Whether other forests in the area with a similar history is successfully recuperating may also be indicative. If in doubt – classify as a natural ecosystem.

2.6 GRASSLANDS AND SAVANNAS

Open grasslands often blend seamlessly into savannas with a certain amount of tree cover, varying from small and scattered, low trees in drier, less fertile areas, to higher, closed-canopy gallery forests along rivers where water availability is less seasonal. Grasslands and savannas are often highly dynamic, and the composition and density of trees and bushes may vary over time with climate, grazing pressure and fire regimes.

Grassland and savanna vegetation evolved over millions of years through interaction with ungulates and natural fires. More recently, pastoralism with livestock have mixed with, and overtaken the role of wild herbivores in many regions, and today almost all grasslands are moulded by seasonal grazing, often interacting with burning or natural fires that create vegetation variation and mosaics. Thus, also very biodiverse grasslands and savannas tend to be cultural landscapes as much as natural ecosystems, and 'historic state' is often a more relevant reference concept than definitions based on absence of human impacts.

The first step to categorise grasslands or savannas as natural or non-natural is to identify the character of the recent past vegetation from maps or early (pre year 2000) satellite imagery – currently grassy areas that were forests at the time are not to be considered natural ecosystems. Areas with little visible change are subjected to further analyses.

In contrast to forest, structure is not very useful for identification of natural grasslands, as these are essentially 'two-dimensional'. (Plant) species composition is more informative, particularly the overall level of species diversity, i.e. the wealth/number of different plants (keeping in mind that many grasslands are highly seasonal, and may look 'species poor' during off seasons drought periods). Experts are expected to recognise key elements of native floral communities, as well as 'degradation indicator species' that thrive in heavily disturbed areas, or in areas recently converted from forest to pasture. The latter include cultivated plants and fallow pioneer vegetation, plants that survive heavy grazing and trampling, nitrophilous plants found around pens and corals, and (native and non-native) grass species spread or introduced to improve pasture productivity. Areas where such plants dominate, or form very prominent parts of the vegetation, may be considered non-natural ecosystems.

Grassland functionality is difficult to observe directly, but may – like long-term viability – be expected to reflect the current disturbance regime, and the extent to which this resembles or replicates historic conditions. Generally, trees are better competitors than grasses and herbs, so wherever conditions permit, forests rule. Grasslands and savannas exist where establishment and growth of trees and bushes is impeded by shallow soils, permanent or seasonal droughts, seasonal inundation, frequent fires, grazing and browsing by wild or domestic herbivores, (or, at high latitudes and altitudes, short and cold growing seasons).

The expert is expected to assess the main historic dynamic factor(s) responsible for the absence/scarcity of trees, and the extent (scale, frequency, distribution etc) to which these factors still operate. Grasslands where natural dynamics, or combinations of natural factors and traditional management regimes maintain grassland characteristics without need for significant, active restoration measures, should be categorised as natural ecosystems.

In sum, applying a precautionary approach, experts may identify as non-natural grasslands and savannas areas that:

- were forested in the recent past, as inferred from high resolution vegetation maps, early satellite imagery, and/or remaining tree stumps; or
- are currently characterised by cultivated plants, pioneer fallow vegetation, or non-native plants that indicate severe degradation.

Grasslands and savannas that do not match any of the above categories should be considered natural ecosystems, off-limits for expansion of crop cultivation.

2.7 WETLANDS

Wetlands are characterised by seasonal inundation or permanent high-water tables. Open wetlands are ‘relatives’ of seasonally wet grasslands, and the border is arbitrary. Similarly, forested wetlands form a continuum with swamp forests.

Many wetlands and wetland mosaic landscapes have extremely rich flora and fauna, and seasonal inundation often limits human access. However, wetlands are also important for people and their livestock, and many areas have been moulded by grazing, harvesting of reeds and grasses, and other uses for so long that they are as much cultural as they are natural landscapes. Such wetlands may nevertheless host rich biodiversity which may be threatened if traditional practices are abandoned in favour of new (often more intensive and less diverse) land use. Wetland species richness, and balances between species, may also be impacted by over-exploitation of fish, fowl or other resources, i.e. if more resources are harvested than are regenerated or renewed over time.

Wetland condition, function and viability is intimately connected to site hydrology. Generally, cultivating crops or establishing plantations in wetlands requires prior lowering of water tables. Thus, wetlands may be considered as non-natural if:

- drainage or reduction of inflow have caused considerable, long-term lowering of water tables; and
- significant restoration measures would be required to restore pre-intervention hydrology.

Water flow may also be directed or diverted for other purposes than draining. Examples include the practices of overland water ‘irrigation’ to aerate plant roots on sloping meadow land common in many areas dependent on hay-making to feed livestock during bottleneck seasons. Such areas – where traditional management is still upheld – often host Rare, Threatened, and Endangered (RTE) plants and should be categorised as ‘natural ecosystems’ in spite of their artificially altered character.

Species composition is a less crucial indicator – even wetlands infested by invasives that cannot be efficiently removed using current practises, may be feasible and realistic to restore in the future given new approaches and technologies. Thus, such ecosystems may be categorised as natural, in spite of their current status, in line with a precautionary approach. Also, new wetlands may be created very rapidly where landslides, rockfalls, dune accumulation, or human infrastructure create barriers that raise water tables. Sites where the new conditions are likely to persist in the long term should be considered ‘natural’ (albeit of very recent origin), also where they are unintentional side effects of human interventions.

2.8 REPORTING

The expert is expected to produce a short report containing:

- an informative map of the proposed expansion area outlining all present ecosystems, with scale and legend;
- brief descriptions of each ecosystem, the experts’ categorisation of this/these as either natural or non-natural, and the rationale(s) for each categorisation;
- expert contact details;
- date and signature;
- Annex 1: Sets of pictures of the ecosystem(s) that substantiates the rationale(s) – landscape overviews as well as close-ups of vegetation - with coordinates, or marked by points on the map;
- Annex 2: Curriculum Vitae, demonstrating the experts’ qualifications and experience as per 2.2.

The grower keeps the report and produces it to auditors upon request.

3. ASSESS RISKS TO HIGH CONSERVATION VALUES (HCV 1, 2 AND 3)

3.1 SCOPE

Bonsucro requires experts to assess the likely presence of HCVs, and to recommend how to mitigate potential risks to these, prior to expansion of crop cultivation in medium risk scenarios (risk mitigation procedure C). The assessment will be preceded by identification of natural ecosystems as outlined in section 2, the report of which (produced by the same or another expert) is the point of origin for this additional HCV risk assessment. Note that Bonsucro-certified growers are not allowed to expand cultivation into any areas of natural ecosystems, and that, consequently, section three procedures only apply where at least some of the originally proposed expansion area has been categorised as non-natural ecosystem(s).

Normally, HCV assessments are expected to cover all six categories of HCVs, including ecosystem services (HCV 4) and local livelihoods and culture (HCV 5 and 6). However, these aspects are also addressed elsewhere in the Bonsucro standard. HCV 4 issues are addressed through the requirements to develop Water Management and Soil Management Plans. Key components of HCV 5 and 6 are addressed through: Bonsucro's overall ban on conversion of natural ecosystems,
the FPIC requirements as outlined in indicator 2.5.1 ('The operator identifies legal and/or customary rights in relation to land and water users, and any transfer of those rights to the operator is done so on the basis of engagement and consultation '), and by the risk mitigation procedures for expansion which require growers to "Identify any parties with legal or traditional use rights to the area and document the process to seek their informed consent to the expansion".

Taken together, these provisions are considered adequate to safeguard HCVs 4, 5 and 6 potentially affected by expansion in low and medium risk contexts (risk mitigation procedures A, B and C). However, large-scale, high risk expansion scenarios (risk mitigation procedure D) still require full HCV assessments addressing all six HCVs conducted by licensed HCV assessors[2].

The assessment of risks to environmental HCVs and potentials to mitigate these as part of the risk procedure C entails:

- assessing the likelihood that HCVs 1, 2 or 3 are present in the proposed expansion area and/or in the nearby landscape;
- estimating the extent to which these values may be directly or indirectly threatened by the proposed expansion;
- identifying and describing mitigation measures beyond non-conversion of natural ecosystems that, properly implemented, are likely to reduce risks of HCV loss or degradation to low[3] levels;
- identifying any areas where significant risks are likely to remain in spite of mitigation efforts, and clearly state such areas as off limits to expansion.

In so doing, the expert should apply a precautionary approach: if there are reasonable indications that an HCV is present, it should be assumed to be present. However, to strike the right balance, the HCV definitions must be adhered to. It is not enough for an area to be of general conservation value - to qualify as HCVs. Biodiversity, landscapes or ecosystems must be significant in a national or regional perspective, i.e. stand out in relation to other comparable areas.

[2] High Conservation Value Assessors are licensed through the Assessor Licensing Scheme. ALS Assessors can be found through the HCV Network website https://hcvnetwork.org/find-assessors/. In countries where there are no ALS assessors, HCV assessments may be undertaken by other, competent and experienced assessors applying HCVN procedures and guidance materials.
[3] 'Low risk' may be conceptually interpreted as 5% or lower.

3.2 QUALIFICATIONS

The expert must have adequate theoretical and practical subject matter knowledge, normally an academic degree in botany, zoology, ecology or similar, as well as basic remote sensing imagery interpretation skills. The expert must also be familiar with the HCV concept and its application, preferably gained through a combination of attending specific training courses[4] and participation in HCV assessments. Auditing experience and personal integrity are other key requirements.

3.3 TERMS AND TIMEFRAMES

Experts may be commissioned by grower operators themselves, or by the mill operator supporting their suppliers. The work is assumed to be conducted remotely, combining data from satellite imagery (recent, cloud-free pictures of as high resolution as is available) and internet sources, with information from local environmental NGOs or ecologists as relevant. The time required will be highly scale and context dependent – from maybe a day or two in simple, medium scale scenarios, to a week or more for more complex, large scale expansions. Timeframes and fees are to be agreed by the parties.

3.4 HIGH CONSERVATION VALUES

High Conservation Values (HCVs) form a set of values of critical importance for humans and nature. The HCV concept is widely recognised by businesses, civil society organisations and development agencies, and HCVs are referred to by a range of international standard-setters, initiatives and platforms as well as by a number of governments and government agencies.

High Conservation Values (HCVs) form a set of values of critical importance for humans and nature. HCVs fall into six categories, spanning environmental values of species, ecosystems and landscapes (HCV categories 1 - 3), through to ecosystem services, and key resources for local livelihoods and culture (HCV categories 4 - 6). :

HCV 1, Species diversity: Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.

HCV 2, Landscape-level ecosystems and mosaics: Large landscape-level ecosystems, ecosystem mosaics, and Intact Forest Landscapes (IFLs) that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.

HCV 3, Ecosystems and habitats: Rare, threatened, or endangered ecosystems, habitats or refugia.

HCV 4, Ecosystem services: Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.

HCV 5, Community needs: Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.

HCV 6, Cultural values: Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.

4 For more information, see https://hcvnetwork.org/workstreams/learning/

Most certification standards for responsible cultivation have provisions for maintaining HCVs – in ongoing operations, and/or as a means to protect critical environmental and social values from negative impacts caused by expansion of cultivation into new areas. Standards also increasingly adopt risk-based frameworks for implementing the HCV approach, in order to reserve complete, professional HCV assessments for high-risk scenarios, and allow for simpler procedures, conducted by growers themselves and/or supported by local expertise, where risks are lower.

HCVs often depend on natural ecosystems, so typically they do overlap a lot. However protecting natural ecosystems does not guarantee the protection of HCVs, and vice versa.

HCVs beyond natural ecosystems:

- An example of environmental HCVs that can extend beyond natural ecosystems are wide-roaming species important for conservation, such as wild cats and elephants, that move and forage in many different kinds of vegetation including crop fields and plantations. Protecting these HCVs, if present, will involve measures beyond maintaining natural habitats, e.g. strategies to resolve human-wildlife conflicts, or enforcement of hunting legislation.
- The social HCVs are tightly linked to local people, and some community needs e.g. shifting agriculture, water access points, occur outside of natural ecosystems.

Natural ecosystems without HCVs:
This is particularly the case in production landscapes that have experienced wide-scale development and land use change over an extended period of time.

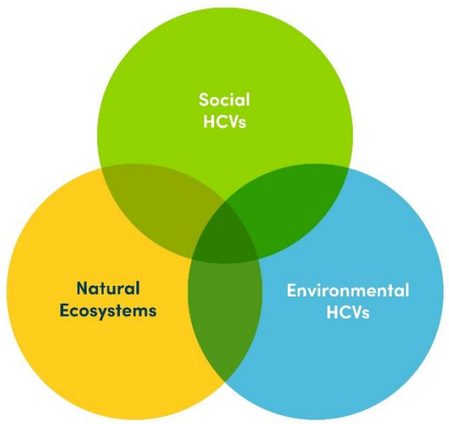


Fig.1. The relation between HCVs and natural ecosystems

The generic, global HCV definitions need to be interpreted to be applicable in the local context. The following sub-sections outline the key elements of HCV 1,2 and 3. For more detail, see the HCV Network Common Guidance for the Identification of HCV (available in eight languages): https://hcvnetwork.org/library/. The expert should also be familiar with any national HCV interpretation materials: see https://hcvnetwork.org/library/ and Forest Stewardship Council national standards for Forest Management (Principle 9) and Controlled Wood (section 3).

3.5 IDENTIFYING HCV 1

HCV 1 Species diversity. Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.

Endemic (range-restricted) species normally have very limited geographic distributions. They may also (but not always!) exist in smaller numbers than more widespread species, and if so be particularly vulnerable to threats. However, some endemics are either very common in a certain area, or considered endemic in large reference perspectives, (e.g. a species 'endemic' to South America). Consequently, normally only endemic species that are also globally or nationally classified as rare, threatened or endangered (RTE) by the International Union for Conservation of Nature (IUCN) and/or nationally protected, are considered HCV 'candidates'.

Naturally rare species are found in few places and /or in low numbers because their habitats are rare (i.e. mosses that only grow on bedrock that contains certain rare minerals), or because they occur close to the limit of their natural geographical distribution (even if they are common elsewhere). Species may also be rare as a result of human activities like habitat destruction, overhunting, or climate change, in which case there is also often on-going threats. Much like endemism, the concept of rarity lacks an explicit spatial reference, and assessors often pragmatically take 'rare' to equal IUCN threatened species, (those particular rare species under little or no threat - and so of less concern - often considered similar to IUCN category Near Threatened, NT).

Threatened and endangered species have experienced, are undergoing, or risk severe population decline. Species classified by IUCN as Critically Endangered (CR), Endangered (EN) and Vulnerable (VU), are referred to as threatened. The IUCN red list, https://www.iucnredlist.org/, contains relevant species-specific information on global distribution, population trends, habits preferences, threat factors and conservation activities. Species, the trade of which is regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), as well as nationally protected species, are also normally considered HCV 1 candidates. Note that IUCN Red Listing remains incomplete and that many species have not yet been assessed by the IUCN Species Survival Commission. Red-listing may occur both at national and regional levels, so information may have to be gathered from several sources. For more information on how to access data on RTE and CITES species see Annex 1.

Concentrations of single species may be considered HCV 1 if the species is threatened according to IUCN or nationally protected, and the concentration is nationally significant (as identified and recognised by conservation authorities, academia or acknowledged NGOs). However, as biodiversity and habitat loss has continued unabated in many areas over the last decades, assessors have come to consider also small 'concentrations' of EN species, and even individual specimens of CR species, significant enough to meet the definition. Seasonally occupied sites and habitats essential for the breeding, roosting, hibernation or migration of HCV 1 species also qualify.

In terms of impacts of conversion, two broad categories of species may be distinguished. 'Site species' are specialists closely linked to a certain kind of habitat, the availability of which often limits species occurrence. Site species may be small animals with limited home-ranges, or plants that disperse very locally, through heavy seeds or vegetative reproduction. 'Landscape species' move and disperse over much larger distances. These include wide-roaming generalist large herbivores and carnivores that use a variety of different habitats over time, and are limited mainly by availability of food, persecution or hunting.
Conversion for crop cultivation fundamentally changes habitat and ecosystem conditions. Applying a precautionary approach, site-dependent animals living in the area prior to conversion may be assumed to become lost (to the extent they still remain in areas transformed from natural to non-natural ecosystems). Large, mobile animals however, may survive in the wider landscape if they are not persecuted, and there is enough food and shelter (often related to the proportion of natural habitat remaining within their home ranges).

3.6 IDENTIFYING HCV 2

HCV 2 Landscape-level ecosystems and ecosystem mosaics and Intact Forest Landscapes (IFLs) that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.

Intact forest landscapes, IFLs, are remaining large areas of forests and forest mosaics, minimally influenced by human economic activity and without signs of logging, mining or infrastructure visible on satellite imagery. IFLs store lots of carbon in the trees and in the soil and have capacity to host large proportions of the regional fauna and flora.

In principle, large landscapes should correspond to areas needed to maintain viable populations, especially of big and wide-ranging species, but in practice also smaller areas that contribute to species survival may qualify. A threshold of 500 square km (50,000 ha) is widely used, but thresholds of 5000 – 10000 ha may be more appropriate in regions that have experienced substantial habitat fragmentation and degradation.

Most or all relatively little impacted forest areas larger than 50,000 ha are already identified and mapped as IFLs, allowing assessors to focus attention on globally, regionally or nationally significant non-forest landscapes – large areas/mosaics of savanna, grassland and wetland that have not been impacted by large scale clearance, intensification of grassland management, infrastructure, over-hunting, drainage, damming, invasive species or other major anthropogenic disturbances – i.e. areas that may be expected to retain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance. It is not necessary that the area is totally undisturbed or pristine. Some species may be locally extirpated or missing, especially vulnerable or selectively hunted or harvested species. HCV 2 status can apply even when species lost include some large, keystone or iconic species, particularly if there is a reasonable chance of these being re-established in the future.

3.7 IDENTIFYING HCV 3

HCV 3 Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.

These are ecosystems and habitats of special importance because of their rarity[5], the level of threat they face, or their unique characteristics. The size, age, structure and species composition of an ecosystem are also important criteria - an ecosystem that is common in one area or country may be scarce and fragmented (rare and threatened) in another country. Habitat refers to the place or type of site where a population or organism occurs. These may be synonymous with ecosystems, or identified at a smaller scale (in which case they are usually too small to be significant at a national level). Refugia include isolated ecosystems sheltered from current changes like human threats or climatic events, as well as areas where certain types or assemblages of organisms persisted e.g. when glaciations greatly reduced habitable areas elsewhere. Refugia often support high overall species richness and significant numbers of endemic species.

IUCN has set up criteria for threats to ecosystems analogous to those used for species. As examples, ecosystems that have lost more than half their original extent within the area of reference over the last fifty years are classified as Endangered (EN), while ecosystems that have been reduced by 80% are considered Critically Endangered (CR). As mentioned, the concept of rarity requires a certain, defined geographical reference area. This is normally taken to be the country where the assessment is conducted. However, countries come in very different sizes, and national subunits like states or provinces, or biogeographical units from 10 to 100 million hectares like WWF Ecoregions[6], may be more relevant references in large countries.

In practice, most or all rare, threatened, or endangered ecosystems and refugia also qualify as ‘natural’, and so are already exempt from conversion by Bonsucro certified growers. There may be exceptions, though, i.e. areas where (intentional or unintentional) human interventions have created non-natural habitats with unique conditions for certain rare species.

[5] Interpreted as of global, regional or national significance in line with HCV 1 and 2
[6] https://www.worldwildlife.org/publications/terrestrial-ecoregions-of-the-world.

3.8 POTENTIAL NEGATIVE IMPACTS

As HCVs 1-3 are largely linked to natural ecosystems, Bonsucro's ban on expansion of new crop cultivation into such areas significantly contributes to safeguard HCVs, allowing experts to focus on:

- likely negative impacts on potentially present wide-roaming RTE species, within as well as outside areas of natural ecosystems, as a result of the proposed expansion;
- likely degradation of, or increased pressure on remaining, nearby areas of natural ecosystems that may affect RTE species.

Impacts on RTE animals include scenarios where expansion of crop cultivation contributes to increase hunting (for livelihood or leisure) to levels that cause population declines. Expansion may also exacerbate human-wildlife conflicts and associated threats such as use of traps or poisoned baits to persecute predators. Conflicts may also escalate where expansions results in lower availability of prey for top carnivores, forcing these to turn to domestic livestock for food.

There may also be impacts on non-target animals of pesticides and other chemicals - examples include using poisons against predators, which makes meat from the poisoned carcasses lethal to eagles and vultures. Wide-roaming RTE species may also be affected by conversion of non-natural ecosystem areas that serve as corridors channeling movement and migration, and by new fences or infrastructure that restricts mobility. RTE plant species may be sensitive to increased levels of collecting and harvesting (of e.g. rare cacti, orchids and timber species).

Species may also suffer from indirect impacts on remaining natural ecosystems, including opening of new roads that facilitate access to previously less accessible areas, increased harvesting of wood for construction, fencing, fuel or charcoal that open up forests and reduce habitat quality for species dependent on shade and humidity, and conversion of tree plantations to agriculture that increases edge exposure of remaining natural forests. Other potential impacts are run-off from new fields causing pollution, siltation and or nitrogen overload of downstream watercourses and wetlands, and increased pressure on water resources and aquifers from irrigation affecting the hydrology of nearby natural ecosystems.

Potential – direct and indirect – impacts on areas of natural ecosystems with a high probability of hosting RTE species should be given particular attention. Such 'priority conservation areas' include legally protected areas, Intact Forest Landscapes, Key Biodiversity Areas, Ramsar sites and UNESCO world heritage sites (see more details on priority conservation areas in the ""Bonsucro Guidance for Operators – Supply Base Mapping" for 4.1.1).

3.9 IDENTIFYING MITIGATION MEASURES

Where HCVs 1,2 or 3 are likely to be present in the proposed expansion area, or in the nearby landscape, the task of the expert is to estimate the extent to which these values may be directly or indirectly threatened by the proposed expansion. Areas that can be expanded into without significant (on- or offsite) negative impacts on HCVs 1,2 and 3 should be classified as low risk areas. Areas where this is not the case, should be classified as of elevated risk. For these, the expert needs to consider if there are potential mitigation measures that, properly implemented by the operator, will reduce risks to environmental HCVs to low levels.

Where this is likely to be the case, the expert should identify what (single or set of) mitigation measure(s) operators need to take prior to, during and after the expansion, in order to comply with the requirements of 1.2.2. These measures should be described[7] so as to facilitate their implementation by operators (how?, where?, when?), in layman language that avoids technical terminology.

Areas where mitigation is unlikely to effectively reduce associated risks to low levels should be clearly stated as off limits to expansion. This includes cases where the information does not allow for clear conclusions, in line with a precautionary approach.

3.10 REPORTING

The expert will write a short, signed report containing:

- an informative map of the proposed expansion area, depicting each sub-area referred to, with scale and legend (the map produced during the identification of natural/non-natural ecosystems may be used as template);
- brief descriptions of non-natural ecosystem area(s) within the proposed expansion site, outlining what mitigation measures growers are required to take in order to expand into these (where relevant);
- classification of each area as of:
    a) low risk of loss or degradation of HCV 1,2 or 3 from expansion of crop cultivation into the area;
    b) low risk of loss or degradation of HCV 1,2 or 3 from expansion of crop cultivation into the area, provided that the operator implements the full set of recommended mitigation measures;
    c) high risk therefore expansion should not proceed, as it is not possible to mitigate risk of loss or degradation of HCV 1,2 or 3 following expansion of crop cultivation into the area.
- expert contact details;
- date and signature;
- Annex 1: Sources of information consulted as part of the work.
- Annex 2: Curriculum Vitae, demonstrating the experts' qualifications and experience as per 3.2.

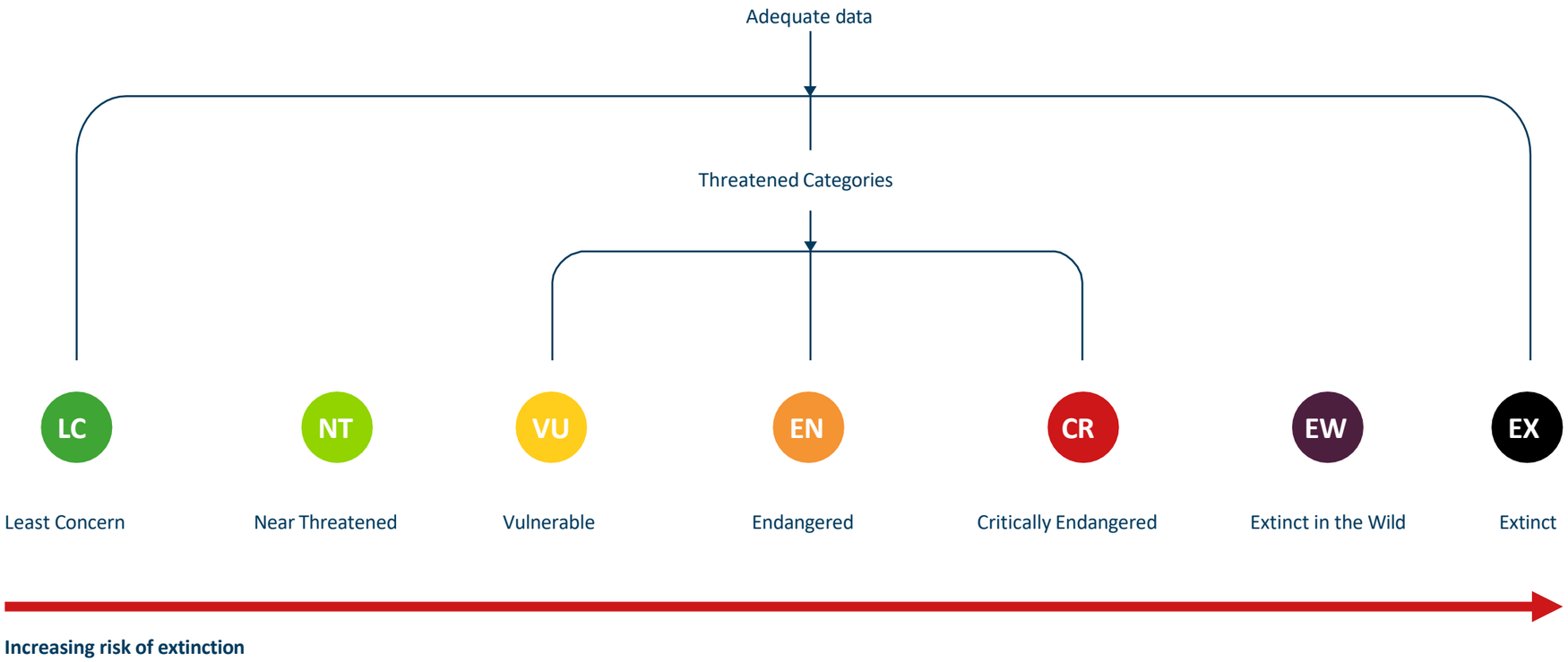
The operator must keep the report, include the report as documentation submitted to the mill operator for approval before proceeding with land preparation, and to be made available to auditors upon request.

[7] Where relevant with links to readily accessible information sources

ANNEX 1. PRIORITY CONSERVATION SPECIES

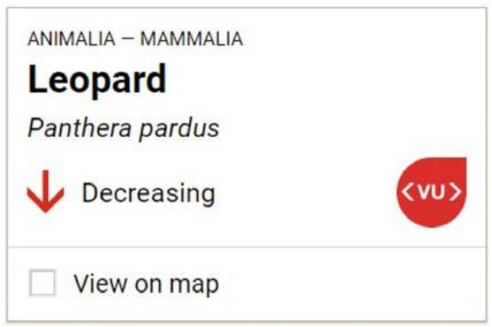
RED-LISTED SPECIES

Individual species (or groups of species) that characterise a priority conservation area often have their own, very specific habitat requirements and associated threats. The main source for such information is the global IUCN Red List, https://www.iucnredlist.org/
The Red List classifies species into categories (see below figure) based on the risk of extinction, using best available data on distribution, population sizes and trends. Currently more than 100 000 species are included – a third of which are considered threatened to go extinct.



To access information, type in the name of the priority conservation value species in the search-box, either the common (English) or the scientific (Latin) name. Note that the search may turn up more than one species that contain the same name element. As an example, searching for ‘leopard’ generates not only the mammal (which was probably the one you looked for!), but also a ‘Leopard Rocket frog’, a ‘Leopard lizard’, and no less than four different Leopard fish species. Sometimes it is not clear what kind of animal the English name refers to. In such cases it is useful to know the Latin names of some major classes of (backbone) animals: Mammalia (mammals), Aves (birds), Reptilia (reptiles), Amphibia (frogs, newts and salamanders) and Actinopterygii (most fishes).

Each species appears with a box, as in the leopard (big cat) example below, telling you that the leopard is categorised as globally ‘Vulnerable’ (i.e. considered threatened) and that global populations are decreasing.



A IUCN Red List ‘starting box’ generated through search for ‘leopard’

Ticking ‘View on map’ you also learn that leopards used to be present in all tropical and subtropical parts of the Old world, but that they now occupy less than half their original area of distribution.
Now click on the species name “Leopard” in the box. This generates a frontpage fact sheet with brief summaries of leopard habitat and ecology, threats and conservation measures, and numerous links to more detailed information. You can also go directly to the full text through ‘Skip to text summary’ in the upper right of the front page.
Unfortunately, not all possible priority conservation species are as well researched as leopards. Some (so far relatively few) countries have national Red Lists with relevant information - check https://www.nationalredlist.org/ . The frontpage map function is not (yet) as informative as it could be – better to go directly to ‘Library’ at the top bar and select the relevant region (Africa, Asia etc). This produces a display of all national Red Lists from the region – to access a specific publication, click on the superimposed export-symbol, and download through the link at the bottom of the new page. (Note that most countries have not produced National Red Lists, and those that exist often focus on certain groups of organisms like birds and mammals).

CITES species

Species threatened by international trade of live or dead specimens or parts of specimens are included in the CITES species list, and are afforded varying degrees of protection depending on whether they are assigned to the CITES Appendix I, II and/or III. CITES listed species are considered HCV 1, in particular those assigned to Appendix I which are most threatened due to trade. The CITES website provides country profiles https://cites.org/eng/parties/country-profiles that includes
the management authorities and links to relevant legislation, national resources and photographs of the species that can be used for outreach materials. You can also use the online resource https://www.speciesplus.net/species to filter and download CITES species list by country and Appendix (I is the most important), to extract a list of potentially relevant species. This information and materials may also support implementation of criteria 4.1.1 so the operator shall ensure that the key biodiversity and ecosystem services are mapped.